

ROLE OF DIAGNOSTIC RIGID NASAL ENDOSCOPY IN THE EVALUATION OF BLEEDING POINTS AND MANAGEMENT OF EPISTAXIS

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ABSTRACT

Introduction

Epistaxis is one of the most common ENT emergencies. Causes of epistaxis can be idiopathic, local, or associated with systematic conditions. Anterior rhinoscopy gives a limited view of the nasal cavity. Difficulty in the localization of bleeding points on anterior rhinoscopy is commonly encountered. We often face difficulty in the localization of bleeding points, especially the hidden areas. Nasal endoscopy helps to identify the hidden bleeding points and specifically control the bleeding.

Objective

The main aim of our study was to visualize bleeding points and demonstrate the efficacy of nasal endoscopy in identifying the bleeding site and controlling epistaxis without nasal packing.

Methodology

This is a cross-sectional study done on patients who presented to the ENT Outpatient Department with complaints of nasal bleeding. They were evaluated by rigid nasal endoscopy for localization of bleeding points as well as control of epistaxis.

Result

Highest number of cases were seen in the 26-35 years of age group. 69.7% (n=53) patients presented with anterior epistaxis and 28.9% (n=22) had posterior epistaxis. Most of the patients i.e., 57.9% (n=44) had no obvious abnormality associated with epistaxis, followed by Deviated Nasal Septum with septal spur i.e., 34.2% (n=26). On localizing the bleeding points, 77.6% (n=59) of bleeding points were seen on the septum. 57.9% (n=44) of patients developed epistaxis on the right side. 58% (n=52) of patients were managed with endoscope-assisted chemical cauterization followed by endoscope-associated electro-cauterization using bipolar cautery.

Conclusion

Rigid nasal endoscopy not only helps in localizing bleeding points but also in managing the cases and is gradually replacing conventional techniques like anterior and posterior nasal packing.

KEYWORDS

Cautery, Epistaxis, Nasal Endoscopy



INTRODUCTION

Epistaxis is frequently encountered as an otorhinolaryngologic emergency and the prevalence varies from 10-12%.¹ Epistaxis is seen in all age groups and is more common in males.² Causes of epistaxis can be idiopathic, local, or associated with systematic conditions.³ Local causes include any pathology in the nasal cavity, paranasal sinuses, or nasopharynx. Associations of epistaxis have been linked with systemic conditions such as cirrhosis of the liver, coagulopathies, and also the use of anticoagulant medications for a long time.^{2,3}

The nasal cavity is a highly vascular structure, contributed mainly by branches of the external carotid artery anastomosing with branches of the internal carotid artery.² Sphenopalatine artery is a major contributor to blood supply in the nasal cavity. Basically, epistaxis is classified into anterior and posterior epistaxis.³ Most common site of anterior epistaxis is Little's area, a vascular area formed by anastomosis of branches of the external carotid area with greater contribution from a branch of the sphenopalatine artery.¹⁻³ Woodruff's plexus is a venous plexus in the posterior part of the inferior meatus, which is considered to be the site of the posterior epistaxis.⁴

We often face difficulty in the localization of bleeding points, especially the hidden areas. Anterior and posterior rhinoscopies are not sufficient in visualizing bleeding points.^{3,4} They give a limited view of the nasal cavity, resulting in poor visualization of hidden areas. Difficulty in localization of bleeding points on anterior and posterior rhinoscopy is a commonly encountered problem during the management of epistaxis. Furthermore, at the time of active bleeding when patients are usually in a state of stress, it becomes almost impossible to visualize the bleeding point completely without the use of endoscopes.⁵ Nasal endoscopy helps to identify the hidden bleeding points and specifically control the bleeding. Without proper visualization, it becomes difficult to control the bleeding. Nasal endoscopy is extremely useful in not just identifying bleeding points but also controlling the bleeding.^{2,3}

Hirschman is credited for his first attempt to examine the nasal cavity via nasal endoscopy in 1901. He utilized a modified cystoscope to examine the sinonasal cavity. Reichert is remembered for the first endoscopic procedure. He named the procedure rudimentary maxillary sinus manipulations.⁵ In 1925, Maltz made wide use of nasal endoscopes for diagnostic evaluation of the sinonasal cavity and coined the term 'sinuscopy'. The creation of the Hopkins rod system in the 1960s is considered the major landmark in the field of nasal endoscopy. However, Messerklinger used a rigid endoscope for the first time in endoscopic nasal and sinus surgery.^{5,6} Messerklinger published a book in 1978 on diagnostic nasal endoscopy of the nose and paranasal sinuses which detailed the endoscopic anatomy and pathology of this region and started to utilize polysomnography to improve visualization. The use of an endoscope has helped to understand intranasal anatomy and improved visualization as well as the management of intranasal pathology.⁷

Epistaxis is mostly controlled without intervention. However, around 6% of the cases need intervention to control bleeding and only 1% require hospitalization, with a mortality rate below 0.01%.⁶ Epistaxis can usually be controlled by applying local pressure. However, intervention might be required when not controlled spontaneously and by conservative management. Management ranges from the application of topical vasoconstrictors, nasal packing, chemical or electro cauterization, and embolization to even ligation of vessels in rare cases.^{7,8}

METHODOLOGY

This was a descriptive cross-sectional study conducted among patients attending ENT OPD at Kathmandu University School of Medical Sciences from 25th November 2020 till 25th April 2021. The main objective of our study was to demonstrate the efficacy of identifying the bleeding site by nasal endoscopy and controlling epistaxis without nasal packing. Written informed consent was obtained from all the participants. Ethical approval was taken from the Institutional Review Committee of Kathmandu University School of Medical Sciences. A total of 76 patients above 16 years of age presenting with spontaneous epistaxis were included in the study. The pediatric population was wholly excluded from this study considering compliance with nasal endoscopy. Nasal bleeding following nasal surgeries like Septoplasty and Functional Endoscopic Sinus Surgery were excluded from the study. Similarly, patients presenting with epistaxis secondary to bleeding disorders, facial and nasal trauma, pregnant women along with those not willing to give consent were excluded from the study.

First of all, nasal cavities were inspected through anterior and posterior rhinoscopies. Then nasal cavities were packed with cotton soaked in 2% Lignocaine and Oxymetazoline for 15 minutes. After the removal of nasal packs, nasal endoscopy was performed with 0°, 30°, and the 45° Hopkin's Rod, 4mm in diameter. The first, second, and Third passes were performed sequentially. Bleeding points were visualized, and findings were noted. Bleedings were controlled by 30 % Trichloro Acetic Acid in the OPD, and a few cases were managed with electrocautery in OT. Refractory cases were managed by endoscopic sphenopalatine artery ligation (ESPAL) in operation theatre under General Anaesthesia. Data were recorded in MS excel and analysis was done in SPSS version 21.

RESULTS

The total number of patients included in the study was 76. Among these 43 (56.5%) were male and 33(43.5%) were female. Patients from 18 to 81 years were included in the study. The mean age group was 38±13.4 years. The highest number of cases was seen in the 26-35 years of age group (Table 1). Among these patients, 53 (69.7%) patients presented with anterior epistaxis, and 22 (28.9%) presented with posterior epistaxis.¹ patient presented with bleeding



from the anterior as well as the posterior part of the nasal cavity. Bleeding from the right side of the nasal cavity was seen in 57.9% (n=44) and from the left in 40.8%(n=31). Bleeding from the bilateral nasal cavity was seen in 1.3%(n=1). On rigid nasal endoscopy majority of patients, i.e., 57.9%(n=44) had no obvious abnormality associated with epistaxis(Table 2). This was followed by Deviated Nasal Septum with a septal spur (Figure 1). On localizing the bleeding points, 77.6% (n=59) of bleeding points were seen on the septum (Table 3). 69.7% of patients (n=53) presented with bleeding points anterior epistaxis, taking an imaginary line drawn from the anterior nasal process of frontal bone to nasal spine of a maxillary crest (Cottle's line) as a demarcation (Table 4). 57.9% (n=44) of patients developed epistaxis on the right side (table 5). 58%(n=52) of patients were managed with endoscope-assisted chemical cauterization followed by endoscope-associated electro-cauterization using bipolar cautery. Among those managed endoscopically, the maximum number of patients (58.4%) were managed with endoscopic-assisted chemical cauterization using 30% Trichloro Acetic acid (TCA), followed by Endoscopic Assisted Electrocauterization (15.8%). (Figure 2).

Table 1: Shows the age distribution

Age	Number	Percentage
16-25	11	14.5%
26-35	26	34.2%
36-45	16	21.1%
46-55	10	13.2%
56-65	10	13.1%
>65	3	3.9%
Total	76	100%

Table 2: Abnormalities associated with epistaxis

Abnormality	Number	Percentage
No abnormality	44	57.9%
DNS with septal spur	26	34.2%
Septal Hemangioma	4	5.3%
Septal perforation	1	1.3%
Nasal mass	1	1.3%
Total	76	100%

Table 3: Site of distribution

Septum=59 (77.6%)		Lateral Wall=17 (22.4%)	
Little's Area	53	Middle Turbinate	6
Posterior part of Septum	5	Anterior to middle turbinate	5
Multiple Bleeding points on septum	1	Posterior to middle turbinate	3
		Middle meatus	2
		Inferior meatus	1

Table 4: Types of Epistaxis

Types	Number	Percentage
Anterior Epistaxis	53	69.7%
Posterior Epistaxis	22	28.9%
Both	1	1.3%
Total	76	100

Table 5: Laterality of bleeding

Site	Number	Percentage
Right	44	57.9%
Left	31	40.8%
Both	1	1.3%
Total	76	100%

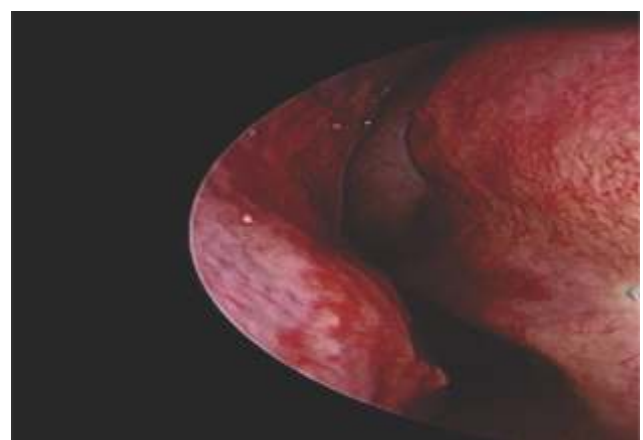


Figure 1: Showing spur with bleeding point

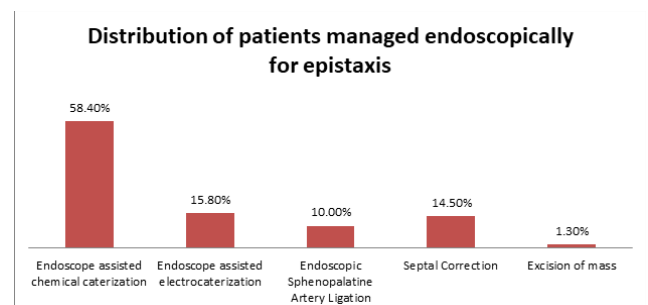


Figure 2: Showing distribution of patients managed endoscopically for epistaxis

DISCUSSIONS

Epistaxis is commonly encountered as an ENT emergency.^{1,2} It is estimated that up to 60% of the population experience an episode of epistaxis in their lifetime.^{8,9} There are multiple treatment options available for the management of epistaxis. However, endoscopic management of epistaxis is gaining popularity. The majority of patients were seen in the age group of 26-35 years of age group similar to studies performed by Kodja et al.¹⁰ Male preponderance is seen in our study similar to different studies performed worldwide.¹⁰⁻¹² Although the exact reason for this could not be found, it is postulated that estrogen in females in a premenopausal state has a protective effect on the nasal



mucosa against epistaxis.¹² More exposure of males to outdoor environmental factors could be another reason for the difference. Anterior epistaxis is seen in 69.7% of patients in our study like patterns seen worldwide as mentioned in different literature.¹³⁻¹⁶ Highly vascular anterior nasal septum is prone to bleeding in most cases. Unilateral bleeding with right-sided predominance is seen in our study like the study performed by Varshney et al¹⁶ as well as by Cassano et al.¹⁷ Although extensive investigation options are available nowadays, similar to most of the studies performed worldwide, no obvious cause was found in 57.9% cases. This finding is similar to studies performed by Ando et al.¹⁸ When no obvious causes are identified then they are labeled as idiopathic or primary epistaxis. This was followed by deviated nasal septum. Stretching of blood vessels seems to be the prominent reason for the bleeding.

There are varieties of options available for controlling epistaxis ranging from conventional methods of anterior and posterior nasal packing to ligation of arteries supplying the nasal cavity.¹⁹ Method of treatment depends upon types, severity, causes, and availability of resources. The use of nasal endoscopes has revolutionized the management of epistaxis. It has not just replaced the use of uncomfortable nasal packing but also minimized hospital stays.^{19,20} Posterior nasal packing may lead to hypoxia, infection, columellar necrosis, and prolonged hospital stay.²¹ In our study, not a single patient required nasal packing as all patients included in the study could be managed endoscopically. 58% of cases were managed by chemical cauterization using 30% Trichloroacetic acid in OPD under visualization of the endoscope. Similarly, 16% of cases were managed with the use of endoscopic electrocauterization of bleeding points. The study performed by Ahmed et al.²² reported an 89% success rate with endoscopic electrocautery in patients with epistaxis. 10% of the cases were managed with Endoscopic Sphenopalatine Artery Ligation (ESPAL) in our study. This is a reliable procedure in managing refractory epistaxis as it ligates a major artery supplying the nasal cavity and therefore minimizes the risk of refractory epistaxis from collateral circulation.²⁰ Success rate of ESPAL is found to be between 92% to 100% as mentioned in different literature.²²⁻²⁴ In our study, none of the patients presented again with epistaxis on monthly follow-ups after ESPAL, during the study period. Nasal endoscopy helps to detect the pathologies inside the nasal cavity that can be easily missed by clinical examinations alone.²⁵ In our study, hemangioma was localized in 5.3% of cases. Similarly, a bleeding nasal mass was localized on the lateral wall of the nasal cavity by nasal endoscopy, which was later diagnosed histologically as an inverted papilloma after an excisional biopsy.

CONCLUSION

We found that the endoscope helped us to clearly visualize the hidden areas of the nasal cavity like the posterior part of the nasal septum, the posterior end of the nasal turbinate, the middle meatus, and the area where bleeding from the sphenopalatine artery occurs. Nasal endoscopy has not just helped in finding the cause and sites of nasal bleeding, but also immediately managing the cases with endoscopic-assisted chemicals and electrocautery. Shortcomings of conventional methods are being replaced by endoscopic management. Surgical intervention with ESPAL is one of the preferred interventions nowadays for refractory cases due to its high success rate, comfort, and reduced hospital stay compared to other treatment modalities such as anterior and posterior nasal packing. Even severe instances can now be managed without nasal packing. Nasal endoscopy, on the other hand, is still not a replacement for nasal packing. However, because preserving the integrity of the nasal mucosa is given utmost importance, a nasal endoscope is gaining popularity as it avoids trauma to the normal mucosa caused by these packing.

RECOMMENDATIONS

Since this study was conducted on a limited number of patients for a duration of five months the outcome of this study could have been more effective if the multicentric study was conducted in a large population for a longer duration. However, the outcome of this study will help in pointing out the need for rigid endoscopy in localizing the bleeding points and effectively managing epistaxis. The use of nasal endoscopy should be promoted in clinical practices and further research should be carried out on a large scale.

LIMITATIONS OF THE STUDY

The main limitation of the study is the small number of participants and short time duration. Moreover, this is a descriptive cross-sectional study.

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CONFLICT OF INTEREST

None

FINANCIAL DISCLOSURE

No financial support was received from anywhere to conduct this study.



REFERENCES

- 1) Charles W, Flint PW. "Epistaxis." Cummings Otolaryngology - Head and Neck Surgery. Philadelphia, PA: Mosby Elsevier; 2010: 687
- 2) Douglas R, Wormald PJ. Update on Epistaxis. *Curr Opin Otolaryngol Head Neck Surg.* 2007 Jun;15(3):180-3. doi: 10.1097/MOO.0b013e32814b06ed.
- 3) Gleeson M. Scott-Brown's Otorhinolaryngology: Head and Neck Surgery. Volume 1. 7th Ed. CRC Press; 2008: 1347-8
- 4) Chiu TW, Shaw-Dunn J, McGarry GW. Woodruff's plexus. *J Laryngol Otol.* 2008;122(10):1074-1077. doi:10.1017/S002221510800176X
- 5) Tajudeen BA, Kennedy DW. Thirty years of endoscopic sinus surgery: What have we learned? *World J Otorhinolaryngol Head Neck Surg.* 2017;3(2):115-21. doi:10.1016/j.wjorl.2016.12.001
- 6) Thornton MA, Mahesh BN, Lang J. Posterior epistaxis: identification of common bleeding sites. *Laryngoscope.* 2005;115(4):588-90. doi:10.1097/01.mlg.0000161365.96685.6c
- 7) Pallin DJ, Chng YM, McKay MP, Emond JA, Pelletier AJ, Camargo CA Jr. Epidemiology of epistaxis in US emergency departments, 1992 to 2001. *Ann Emerg Med.* 2005;46(1):77-81. doi:10.1016/j.annemergmed.2004.12.014
- 8) Althaus AE, Lüske J, Arendt U, et al. Treating epistaxis - who cares for a bleeding nose? A secondary data analysis of primary and secondary care. *BMC Fam Pract.* 2021;22(1):75. doi:10.1186/s12875-021-01411-1
- 9) Klotz DA, Winkle MR, Richmon J, Hengerer AS. Surgical management of posterior epistaxis: a changing paradigm. *Laryngoscope.* 2002;112(9):1577-82. doi:10.1097/00005537-200209000-00008.
- 10) Kodiya AM, Labaran AS, Musa E, Mohammed GM, Ahmad BM. Epistaxis in Kaduna, Nigeria: a review of 101 cases. *Afr Health Sci.* 2012;12(4):479-82. doi:10.4314/ahs.v12i4.13
- 11) Sarhan NA, Algamal AM. Relationship between epistaxis and hypertension: A cause and effect or coincidence?. *J Saudi Heart Assoc.* 2015;27(2):79-84. doi:10.1016/j.jsha.2014.09.002
- 12) Abrich V, Brozek A, Boyle TR, Chyou PH, Yale SH. Risk factors for recurrent spontaneous epistaxis. *Mayo Clin Proc.* 2014;89(12):1636-43. doi:10.1016/j.mayocp.2014.09.009
- 13) Chaaban MR, Zhang D, Resto V, Goodwin JS. Demographic, Seasonal, and Geographic Differences in Emergency Department Visits for Epistaxis. *Otolaryngol Head Neck Surg.* 2017;156(1):81-86. doi:10.1177/0194599816667295
- 14) Bui R, Doan N, Chaaban MR. Epidemiologic and Outcome Analysis of Epistaxis in a Tertiary Care Center Emergency Department. *Am J Rhinol Allergy.* 2020;34(1):100-7. doi:10.1177/1945892419876740
- 15) Kikidis D, Tsioufis K, Papanikolaou V, Zerva K, Hantzakos A. Is epistaxis associated with arterial hypertension? A systematic review of the literature. *Eur Arch Otorhinolaryngol.* 2014;271(2):237-43. doi:10.1007/s00405-013-2450-z
- 16) Varshney S, Saxena RK. Epistaxis: A retrospective clinical study. *Indian J Otolaryngol Head Neck Surg.* 2005;57(2):125-29. doi:10.1007/BF02907666
- 17) Cassano M, Longo M, Fiocca-Matthews E, Del Giudice AM. Endoscopic intraoperative control of epistaxis in nasal surgery. *Auris Nasus Larynx.* 2010;37(2):178-84. doi:10.1016/j.anl.2009.06.008
- 18) Ando Y, Iimura J, Arai S, et al. Risk factors for recurrent epistaxis: importance of initial treatment. *Auris Nasus Larynx.* 2014;41(1):41-5. doi:10.1016/j.anl.2013.05.004
- 19) Asanau A, Timoshenko AP, Vercherin P, Martin C, Prades JM. Sphenopalatine and anterior ethmoidal artery ligation for severe epistaxis. *Ann Otol Rhinol Laryngol.* 2009;118(9):639-44. doi:10.1177/000348940911800907
- 20) Loughran S, Hilmi O, McGarry GW. Endoscopic sphenopalatine artery ligation--when, why and how to do it. An on-line video tutorial. *Clin Otolaryngol.* 2005;30(6):539-43. doi:10.1111/j.1749-4486.2005.01108.x
- 21) McDermott AM, O'Cathain E, Carey BW, O'Sullivan P, Sheahan P. Sphenopalatine Artery Ligation for Epistaxis: Factors Influencing Outcome and Impact of Timing of Surgery. *Otolaryngol Head Neck Surg.* 2016;154(3):547-52. doi:10.1177/0194599815620134
- 22) Ahmed A, Woolford TJ. Endoscopic bipolar diathermy in the management of epistaxis: an effective and cost-efficient treatment. *Clin Otolaryngol Allied Sci.* 2003;28(3):273-75. doi:10.1046/j.1365-2273.2003.00709.x
- 23) Sylvester MJ, Chung SY, Guinand LA, Govindan A, Baredes S, Eloy JA. Arterial ligation versus embolization in epistaxis management: Counterintuitive national trends. *Laryngoscope.* 2017;127(5):1017-20. doi: 10.1002/lary.26452
- 24) Howe DJ, Wazir U, Skinner DW. Outcomes of endoscopic sphenopalatine artery ligation for epistaxis: a five-year series from a single institution. *Ear Nose Throat J.* 2012;91(2):70-2. doi: 10.1177/014556131209100209.
- 25) Min HJ, Mun SK, Lee SY, Kim KS. The Possible Role of Endoscopy in Diagnosis of Benign Tumors of the Nasal Cavity. *J Craniofac Surg.* 2017;28(4):973-75. doi: 10.1097/SCS.0000000000003480.

